# TSB Controller
# 970-TSBC-20

## User manual

ASSA ABLOY

ASSA ABLOY, the global leader in door opening solutions

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# General

Introduction

***ASSA ABLOY Sicherheitstechnik GmbH's***extensive experience, and state-of-the-art production and testing procedures ensure this device is highly reliable.

Instructions for fitters

The following operating and installation instructions contain important instructions, information and recommendations for device installation, set-up and operation. You must comply with these instructions to ensure that the system functions safely without any problems.

Symbols and icons used in these instructions

The symbols in these operating instructions are designed to help you use the devices and instructions quickly and safely.

**Note**
This symbol indicates additional information which is useful when handling devices.

**Warning about a general hazard**
This warning symbol indicates tasks where hazards may arise or device functions may be impaired due to different causes.

1.

**Step in procedure**
The specified sequence of steps will make it easier for you to use the device safely and correctly.

✓

**Result**
This indicates where the end result of a sequence of steps is described.

Packaging and storage

Our devices are carefully packaged to ensure adequate protection during shipment.
When you receive your device, you must check the device and its packaging to ensure that the device is complete and undamaged.

**Risk of injury**
The device must not be used if it is damaged.
Damaged cables and connector assemblies also represent a safety hazard and must not be used.

Intended use

Escape door control components may only be used for their intended purpose. This means that they may only be connected and operated as described in the operating instructions or in the operating instructions for individual devices. It is not permitted to make any changes or additions to approved mechanical and electrical functions in devices.
If any changes are made, any approval for operation becomes invalid.

Working on the system

Any work on electrical connections may only be carried out on the TSB Controller and control devices when they are in a denergised state to eliminate any risk of physical injury or damage to the equipment. Observe VDE regulations in this respect.

Warranty conditions

The warranty is only valid if control devices and connected components are used in a correct manner as intended. Neither the user or installer are permitted to make any changes or interfere with equipment.
***ASSA ABLOY Sicherheitstechnik GmbH's*** Terms and Conditions of Sale and Delivery apply.

Maintenance and care

The TSB Controller is maintenance-friendly.

- Control devices may only be cleaned using just a soft cloth. No dissolvents or cleaning agents may be used.

**Replacing the back-up battery**
Data is backed up using a CR2032 Lithium battery.
The battery must be replaced when necessary.

**Warning of data loss**
When them battery is replaced, data buffering is unpowered for a short time.
This may lead to a loss of data in the worst of cases.
Before changing the battery:
Always back up the data first.
Then replace the battery with the operating voltage switched on.

Included in delivery:

- TSB Controller 970-TSBC-20
- Cross-over cable
- CD with instructions for drivers and service programmes
- User manual

# Operation

## General description

Bus technology is primarily used in modern control technology in equipment where a larger number of individual devices are monitored and controlled. Conventional solutions for such projects involve time-consuming installation work and are consequently expensive. This is where bus technology is ideally suited as it doesn't have the disadvantages of a conventional installation.

effeff has developed a bus system using its TS Bus (door control bus) to meet the requirement for cost-effective installation. The TS Bus uses two-wire technology to ensure that installation between the individual devices and a central control point is restricted to a two-wire bus line.

The bus controller module forms a link between a PC and the TS Bus. All data communication between the PC and the TS Bus passes through the Ethernet port on the PC. Data communication between the bus controller module and the individual escape door control units or escape door control terminals — hereinafter referred to as peripherals — is performed over the TS Bus. Up to 110 peripherals can be controlled and monitored on the PC via the two-wired bus line.

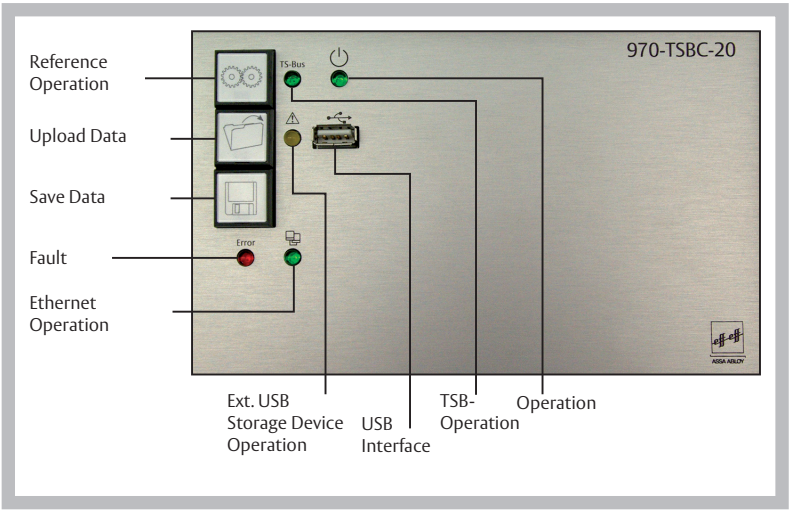
## Usage and range of functions

- Use in systems with up to 110 peripherals.
- Minimum installation work when using effeff TS Bus.
- Buttons to import and save system settings.
- LED indicators for bus master system status messages for TSB 1 and TSB 2 devices.
- Interface for OPC and visual display of building layout.
- FT Manager web interface
  - Configuration and parameterisation for systems and devices
  - Events logging
  - Maintenance module

As a central interface, the FT Manager web interface offers the system integrator the option of integrating configuration and administration functions by linking them into its user interface. No special software must be installed and maintained on the computer except a standard web browser (Internet Explorer 7 and above, Mozilla Firefox 3 and above).
A service PC is directly connected using a crossover cable (included in the supply package). The system can also be integrated into the building network. A patch cable must be used to connect to a building network (not included in the supply package). System security is assured thanks to password protection, a backup function and encrypted transmission to the PC.

**Note**
If the PC should crash, the TS Bus will continue to function. The doors can be controlled using an optional control panel instead.
If the TS Bus fails, the safety functions in escape door control units or escape door control terminals and connected components, such as escape door strikes and emergency open switches, remain operative for safety reasons.

## Controls and indicators




## General information on controls

Peripherals and escape doors are controlled and monitored from the PC, preferably using the effeff escape route visual display programme WebFT. System status messages and statistics are configured and displayed on the integrated web application FT Manager. This is why the bus controller contains only three operator buttons, LEDs for operation and system status messages, and a USB port for saving and re-establishing configuration settings.

Function buttons

**"Start" reference operation**

The reference operation is designed to scan a TS Bus's complete address range and save the detected end devices as a reference configuration.

**Entering and saving system data**

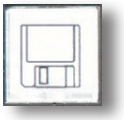
| Indicator functions | Operation Green LED | Fault Red LED | TS Bus Green LED | Ethernet Green LED | Ext. USB Yellow LED |
|---|---|---|---|---|---|
| Reference operation:<br>Press down reference operation button for about 10 sec | On | | Flashes alternately | On* | Flashes alternately |
| Start of reference operation<br>Button can be released | On | | On | On* | On |
| Reference operation complete | On | | On | On* | Off |
| Button released before 10 sec is up | On | | Flashes quickly for 10 sec | On* | |

The "Reference operation" button can be blocked in the software.

**Note**

A new reference operation is required whenever new devices are added to the system or whenever devices are removed.
TSB 2 devices can also be added without a reference operation, although they can only be removed using the web interface or performing a new reference operation.

**Saving data**



The controller configuration settings are saved on an external data storage device (USB flash drive) via the USB port.

The system configuration, settings, log data and authorisations are saved in individual files on the data storage device by pressing this button. The function can be blocked in the system settings.

**Upload data**

Press the button to upload the saved configuration settings from an external data storage device (USB flash drive) via the USB port and transfer them back to the controller's internal memory.

This function enables a data back-up or a new system configuration to be imported into the system.

**Warning**
The data on the controller's internal memory will be overwritten.

It is possible to update individual sections separately by using several files. A plausibility check is performed before data is re-written. If the re-upload is successful, the data storage device function indicator will go out; if there is an error, it will flash quickly for 10 seconds.

Reset to factory setting

**This function resets a fully configured device to its initial state. The external memory is unaffected by the reset.**

**Reset to factory settings**

| Indicator functions | Operation Green LED | Fault Red LED | TS Bus Green LED | Ethernet Green LED | Ext. USB Yellow LED |
|---|---|---|---|---|---|
| Reset to factory settings: switch on the power and press down the "Reference operation" and "Read data storage device" buttons for about 60 sec (the indicator will change after about 45 sec; see next line) | On | On | On | On | On |
| After about 45 sec, hold down the buttons for about 15 sec longer | On | Flashes | Flashes | Flashes | Flashes |
| After about 15 sec, release the normal start controller buttons | On | On | On | On | On |
| If the buttons are released between 45 and 60 sec | On | Flashes quickly | Flashes quickly | Flashes quickly | Flashes quickly |
| Reset to factory settings interrupted before 45 sec is up | As "Controller start" | | | | |
| No reset to factory settings | | | | | |

* Only when network cable is connected

The green LED for the Ethernet lights up or flashes during the controller start phase as well as to display the activated functions during a "Reset to factory settings" operation even if the network cable is not connected.

Indicators and functions

**Operation indicator**
The "Operation indicator" signals that the controller is functioning:
- Power connected: operation indicator is lit

**Error indicator**
System errors are signalled by the "Error indicator":
- No error: error indicator off
- System error: error indicator lights up

**TSB operation**
The "TSB operation" LED signals the TS Bus functions.
- TSB not connected: LED off
- TSB operating without errors: LED is lit
- TSB is not configured (reference operation required): LED flashes
- TSB malfunctioning: the operation indicator and error indicator LEDs flash in parallel

**Ethernet operation**
The "Ethernet operation" LED signals an Ethernet connection operation.
- Connected to network: LED is lit
- Additional data traffic: LED goes out briefly when there is a flow of data

**USB connection function indicator (external data storage device)**
Configuration and logging data can be stored on a USB flash drive, which can be connected via the USB port provided. It is also possible to upload data onto an external data storage device or re-load configuration data into the system without using the web interface.

The LED signals when a data storage device can be removed.
- LED is lit: data storage device cannot be removed
- LED is not lit: data storage device may be removed

**Controller start**

| Indicator functions | Operation Green LED | Fault Red LED | TS Bus Green LED | Ethernet Green LED | Ext. USB Yellow LED |
|---|---|---|---|---|---|
| Controller start | On | On | On | On | On |
| Changeover to system data entry after about 45 sec | | | | | |
| Begin of system data entry | On | | On | On* | On |
| System data entry complete | On | | On | On* | Off |
| Controller initial state | On | | On | On* | |

**Device status**

| Indicator functions | Operation Green LED | Fault Red LED | TS Bus Green LED | Ethernet Green LED | Ext. USB Yellow LED |
|---|---|---|---|---|---|
| Power on | On | On | | | |
| Network connected | On | | | On | |
| Network data traffic | On | | | Off briefly (flicker) | |
| TS Bus not connected or malfunctioning | On | Flashes in pair | Flashes in pair | On* | |
| TS Bus OK | On | | On | On* | |
| Access to data storage device Read data or upload data button activated | On | | On | On* | On |

**Entering and saving system data (reference operation)**

| Indicator functions | Operation Green LED | Fault Red LED | TS Bus Green LED | Ethernet Green LED | Ext. USB Yellow LED |
|---|---|---|---|---|---|
| Reference operation:<br>Press down reference operation button for about 10 sec | On | | Flashes alternately | On* | Flashes alter-nately |
| Start of reference operation<br>Button can be released | On | | On | On* | On |
| Reference operation complete | On | | On | On* | Off |
| Button released before 10 sec is up | On | | Flashes quickly for 10 sec | On* | |

## Types of warning

**Warning**
The bus controller module and connected devices may only be installed and set up for operation by a qualified electrician.

**Attention**
You must observe and comply with the German Electrical Engineering Association (VDE) and local electricity company regulations when installing equipment.

You must also comply with safety regulations regarding work on electrical systems.

**Note**
Components at risk of electrostatic discharge:

Electronic components in equipment should not be touched to ensure that electrostatic discharge does not cause injury or damage. If you cannot avoid touching electronic components, you should use a suitable anti-static tool.

To ensure that the risk of electrostatic discharge is kept to a minimum, the person who is working on the system should ensure that they are not carrying an electric charge. They should take suitable measures such as wearing an anti-static wrist strap.

## Lines and wiring

You must comply with a few installation requirements to ensure that the system functions correctly. Please follow the instructions below and carry out installation and connection work carefully.

**TS Bus installation**

- You must install a separate, shielded line which is used exclusively to connect peripherals to the bus. We recommend using telecommunications cable type J-Y(St)Y with a cross-section of 0.28 mm² or 0.5 mm².
- Do not use free wires in the bus line for additional control tasks or power supply to external peripherals, since this may interfere with data transmission.
- The total length of the bus line should be no longer than 1,000 m and resistance in the line to peripherals should be no greater than 65 ohm. This ensures that no problems arise due to high interconnect capacitances and resistances. We recommend using Bus Repeater 901-35 for projects where longer line lengths are required.
- Install only one wire for the data line and one wire for ground in the bus connection for the whole system. Never connect two or more wires in parallel to increase the cross-section size, as this can cause malfunctions.

**Connecting peripherals to the TS Bus**

Each peripheral features two connecting terminals for the TS Bus
— the TS Bus data connecting terminal for the data line and the TS Bus GND connecting terminal for the system ground. The bus line must be connected to these terminals.

Ensure that the bus line is poled. If the bus line is connected incorrectly, it will short-circuit and block the whole bus system, possibly damaging connected devices permanently. You should therefore take care when connecting up the system.

## Bus controller installation

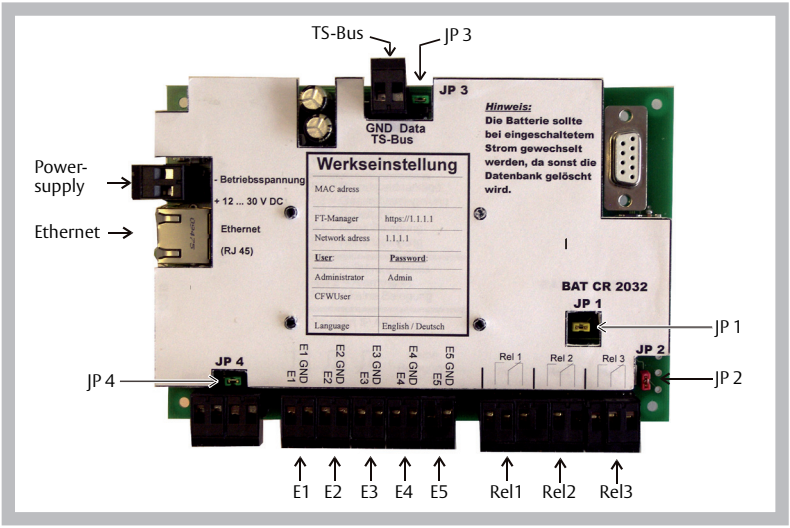
**The bus controller installation location must meet the following requirements**

- It must be on the inside of the building.
- It must not be exposed to any unusual environmental conditions, such as agressive vapours or high humidity.
- The ***970 TSBC*** should be easily accessible, in a protected area and not be exposed to direct sunlight to ensure that the buttons can be easily operated and the indicators can be seen.
- When mounting the ***970 TSBC*** on the wall, take care not to damage any wiring or pipes inside the wall itself. The module rack for the ***970 TSBC*** and fastening screws must not come into contact with conductive elements in the building's structure.

## Power supply

The ***970 TSBC*** must be powered by an external power supply. The power supply must deliver an output voltage between 12 V DC -10 % and 30 V DC +10 and feature a minimum power output of 10 W. The maximum permissible ripple is 50 %.

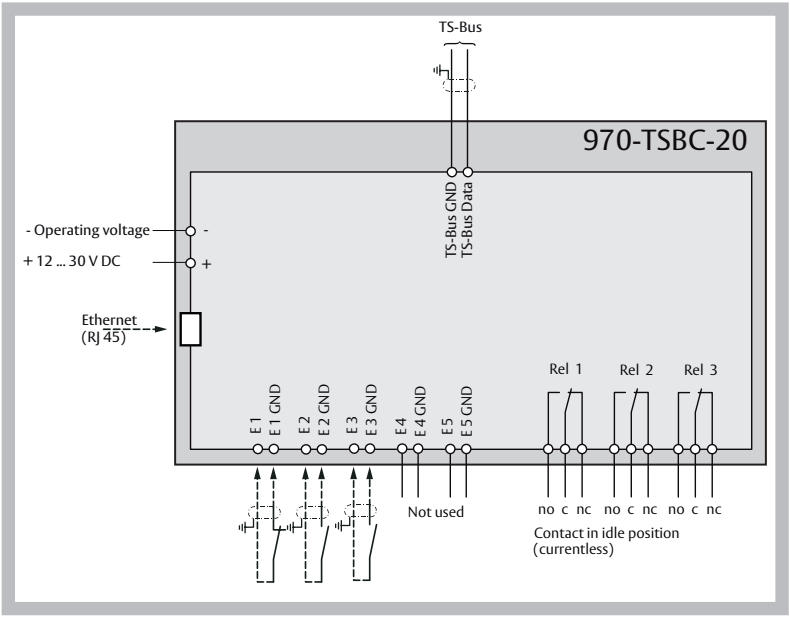
View of circuit boards




## Terminal connections and jumpers

| | |
|---|---|
| E 1 | Input functions are configured using FT Manager. |
| E 2 | |
| E 3 | |
| E 4 / E5 | |
| Rel 1 | Output functions are configured using FT Manager. |
| Rel 2 | |
| Rel 3 | |
| JP 1 | Disconnect battery — Only remove when stored for a very long time to protect the battery, otherwise connected at all times. |
| JP 2 | Tampering contact simulation; bridge must be connected at all times. |
| JP 3 | Activates "Master pull-up resistance".<br>Must be permanently connected, since the TSB Controller is always master. |
| JP 4 | No function at present |

Wiring diagram for TSB Controller




**Note**
Input and output functions are configured using FT Manager.

# Set-up operation

## Check list

**Check installation.**

- Is the power supply to the peripherals secured?
- Are all peripherals, escape door strikes and contacts connected?
- Is the bus line connected to the peripherals?
- Is the power supply connected to the controller?
- Is the bus line connected to the controller?

**Check the settings on the 970 TSB Controller and peripherals.**

- Have the system settings been configured?
- Are all peripherals set to "Bus operation"?
- Has each peripheral been assigned a peripheral address?

## Turning on the system

**Initial operation of peripheral devices**

1. Switch on the power supply to each individual peripheral.
2. Check each individual peripheral at its installation location to verify that it is fully functional.
3. There must be no alarm active on peripherals once they are checked. If an alarm is active, it must first be switched off and the cause of the alarm eliminated before continuing.

**Initial operation of the 970 TSB Controller**

1. Turn on the power supply.

✓ The green operating voltage indicator must light up after the controller is switched on.

2. Switch on your PC and make the required settings in ***FT Manager***.

**Note**

We recommend using FT Manager when putting the system into operation due to the limited diagnosis options on TSB controller.

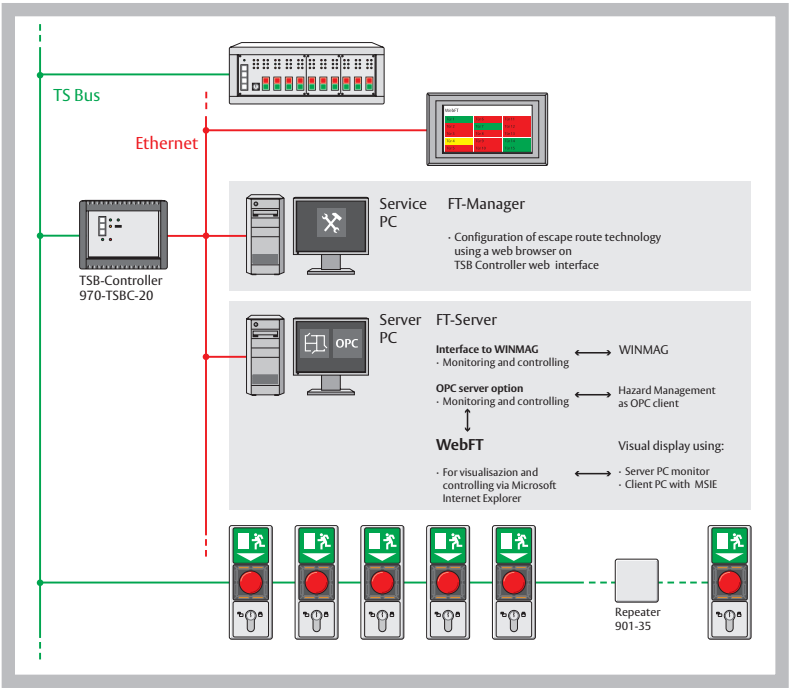
**Network connection**

You need to establish a network connection between the TSB Controller and your PC, so that you can access the web interface in FT Manager.
This can be done in several ways:

- Direct network connection using a cross-over cable (included in supply package)
  - Initial/set-up operation using service PC
- A patch cable to connect to a building network (not included in the supply package).
  - Coordination with the network administrator required
  - Configuration for use in the network.

Network structure

**Escape route technology network structure**




FT Manager

**Connection to service PC**

The network connection between the TSB controller and a service PC is established using a cross-over cable.
The escape route technology is configured using ***FT-Manager*** and a web browser.

System settings

System settings on the controller such as TCP/IP address assignment are made on the ***FT Manager*** web interface.

You will require an internet browser (Internet Explorer version 7 and above, Mozilla Firefox version 3 and above) to use the web interface.

Windows® XP

**Configuring the network connection**

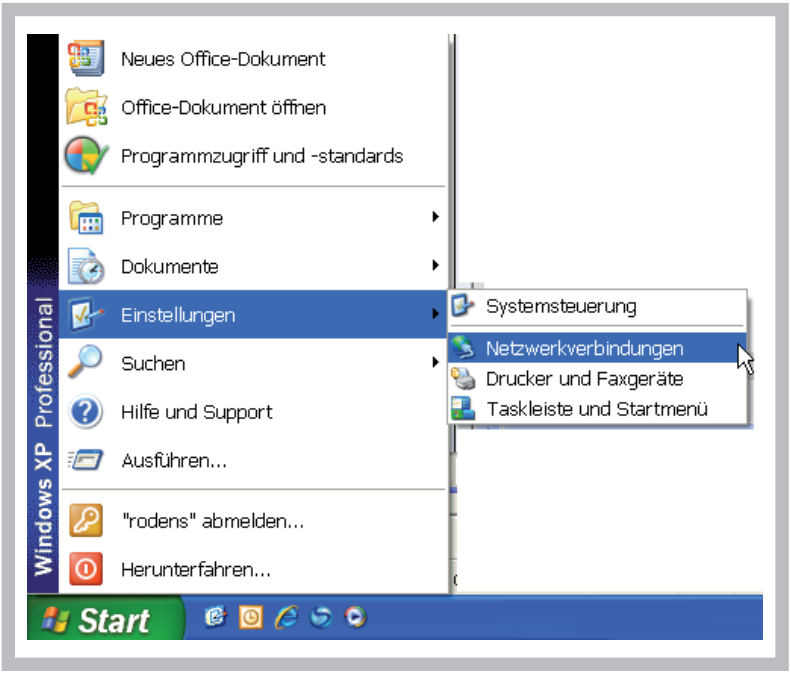
You need to check the LAN settings on the network card and adjust if necessary to ensure that the ***TSB-Controller*** can communicate with your PC.

**The bus controller's DHCP server is active ex works.**

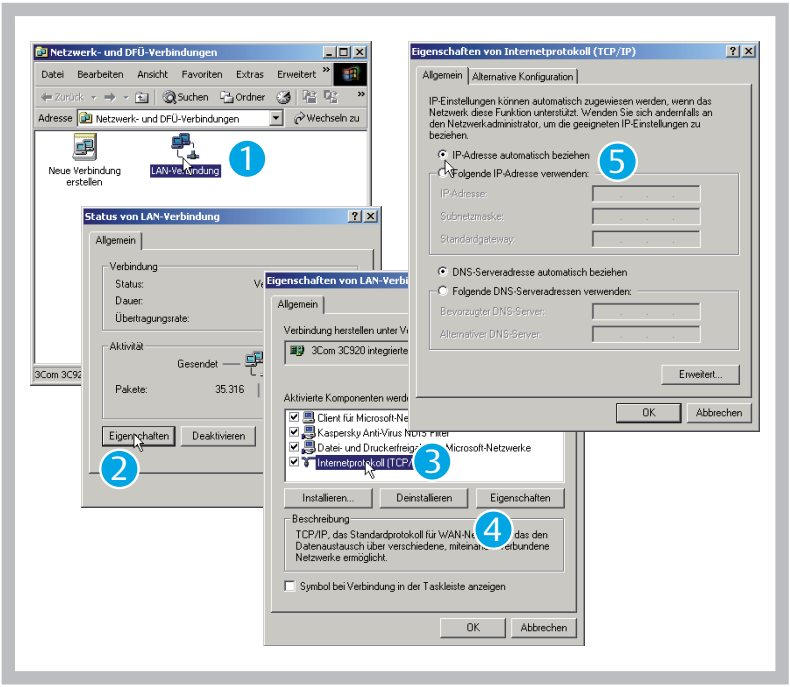
**Note**

The following description is valid for **Windows® XP** in classic view. The procedure may differ depending on your operating system.

- Open up the network and data communications connections using the system controls or start menu, for example.




You now need to open up "Internet protocol properties (TCP/IP)".




Proceed as follows:

1. In the "Network and data communications connections" dialogue box: select "LAN connection".
2. In the "LAN connection status" dialogue box: click on "Properties".
3. In the "LAN connection properties" dialogue box: click on "Internet protocol (TCP/IP)".
4. Click on "Properties".
5. In the "Internet protocol properties (TCP/IP)" dialogue box: select "Obtain an IP Address automatically" and "Obtain a DNS server address automatically".

Windows® 7

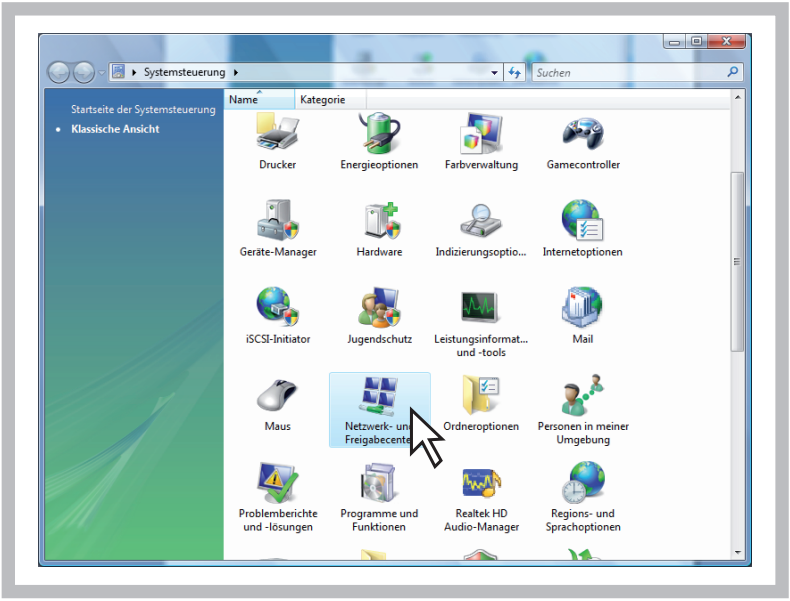
## Configuring the network connection

You will need to adjust the LAN settings on the network card to ensure that the ***TSB-Controller*** can communicate with your PC.

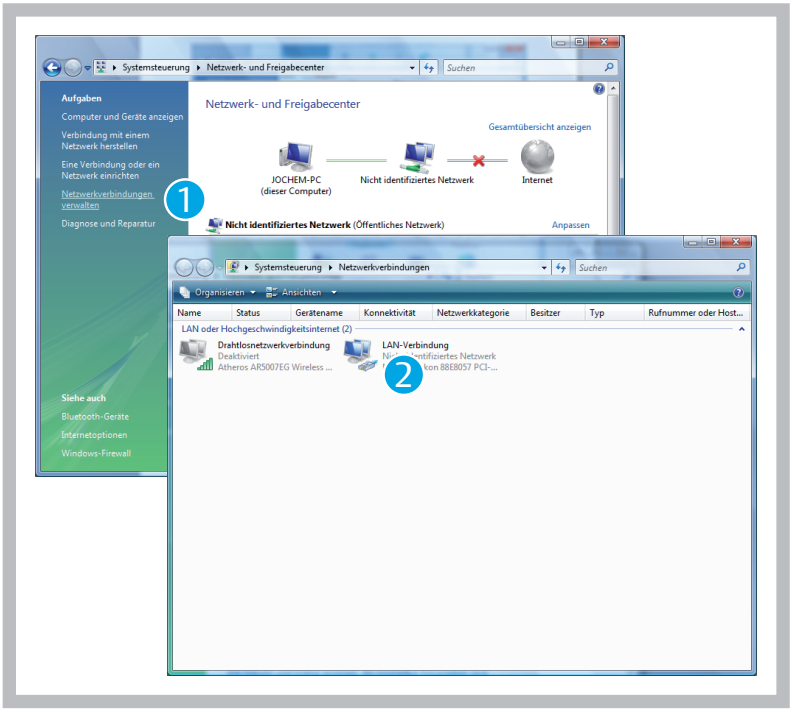
### Note

The following description is valid for **Windows® 7** in standard view. The procedure may differ depending on your operating system.

- Open up the network and data communications connections using the system controls or start menu, for example.

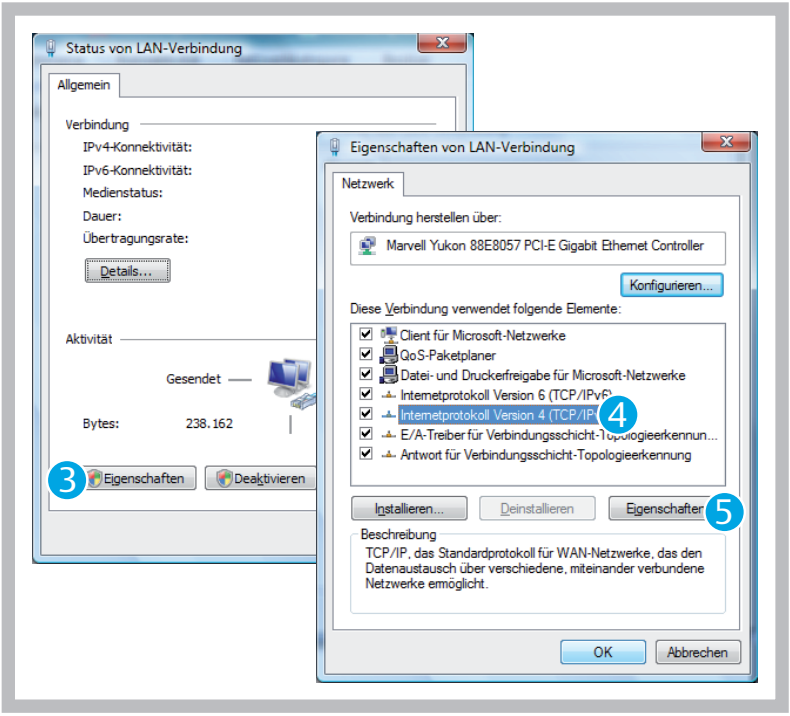



You now need to open up "Internet protocol properties (TCP/IP)".




Proceed as follows:

1. Click on "Manage network connections".
2. In the "Network connections" dialogue box: click on "LAN connection".




1. In the "LAN connection status" dialogue box:
   click on "Properties".
2. In the "LAN connection properties" dialogue box:
   click on "Internet protocol version 4 (TCP/IPv4)".
3. Click on "Properties".
4. As in the example using Windows XP, select "Obtain an IP Address automatically" and "Obtain a DNS server address automatically".

5. Press OK "Accept".

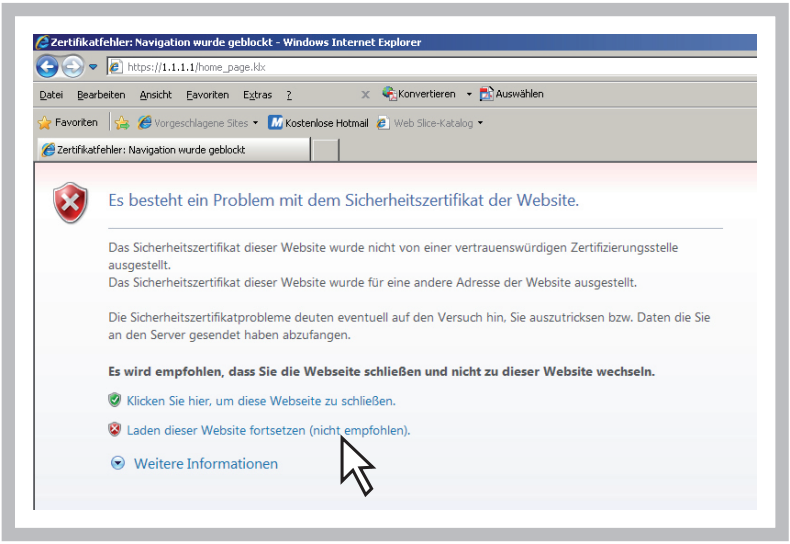
## Opening FT Manager

Once configuration is complete, you can then open up ***FT Manager*** in a web browser.

Proceed as follows:

1. Start your web browser
2. Enter the following URL in the address bar: **https://1.1.1.1** and press enter.

✓ A security notice will appear.


Zertifikatfehler: Navigation wurde geblockt - Windows Internet Explorer
https://1.1.1.1/home_page.klx
Datei Bearbeiten Ansicht Favoriten Extras ?
Konvertieren
Auswählen
Favoriten
Vorgeschlagene Sites
Kostenlose Hotmail
Web Slice-Katalog
Zertifikatfehler: Navigation wurde geblockt
Es besteht ein Problem mit dem Sicherheitszertifikat der Website.
Das Sicherheitszertifikat dieser Website wurde nicht von einer vertrauenswürdigen Zertifizierungsstelle ausgestellt.
Das Sicherheitszertifikat dieser Website wurde für eine andere Adresse der Website ausgestellt.
Die Sicherheitszertifikatprobleme deuten eventuell auf den Versuch hin, Sie auszutricksen bzw. Daten die Sie an den Server gesendet haben abzufangen.
Es wird empfohlen, dass Sie die Webseite schließen und nicht zu dieser Website wechseln.
Klicken Sie hier, um diese Webseite zu schließen.
Laden dieser Website fortsetzen (nicht empfohlen).
Weitere Informationen

**Note**

The security certification encrypts communication between the computer and the***970-TSBC***. This security certification is trustworthy, but the web browser won't recognise it

- You will therefore need to select "Continue to load this website ...".

✓ ***FT Manager*** will now open in the browser window.

In a network

**Connection to server PC**
If the TSB Controller is to be used in a network, you will need to coordinate with the network administrator.

**Configuration for use in a network**
You can permanently assign IP addresses in a network or obtain them automatically.
The ***TSB Controller*** requires a permanent address. The required settings should be configured in ***FT-Manager***.

# Technical data

## Specific values for device

| | |
|---|---|
| Input voltage range | 12 – 30 V DC ± 10 %<br>Max. ripple of 50 % |
| Power input | Max. 9.7 W |
| Protection class | III /extra-low safety voltage |
| Protection rating according to DIN 40050 | IP20 |
| Operating temperature range | 0 – 40 |
| Storage temperature range | -25 - +60 |
| | |
| Battery | CR2032<br>Lithium coin battery, 3V 210mAh |
| Ethernet interface | RJ45<br>Transmission rate 100 MBit/s<br>IEEE standard 802.3.-100BASE-TX |

## Dimensions and design

| | |
|---|---|
| Composite housing | W x H x D<br>175 x 240 x 90 mm |
| Front panel | 3U, HP 42 for 19" rack |

# Notes

ASSA ABLOY is the global leader in door opening solutions, dedicated to satisfying end-user needs for security, safety and convenience.

ASSA ABLOY

**Originally part of the ZEISS IKON AG company founded in 1926, IKON** is ASSA ABLOY's most successful brand for locking and security technology in Germany. The IKON brand produces state-of-the-art products and solutions at the cutting edge of technology. The brand product range includes high-quality mechanical and mechatronic locking cylinders, auxiliary locks, auxiliary security devices, door fittings and door closers. They provide active burglary protection and safeguard both people and property.

**Founded as a precision engineering and electrical engineering workshop in 1936, effeff** is a global leading brand for electromechanical locking and unlocking devices.
Electric strikes, electric dead bolts, security locks, access control systems and escape route technology are among the effeff brand products which today provide security and convenience in over 75 countries throughout the world.

**ASSA ABLOY Sicherheitstechnik GmbH** is your professional partner worldwide in mechanical and electromechanical security solutions for safety, security and convenience in buildings.
The company develops, produces and markets high-quality products and multi-purpose systems under the established IKON and effeff brand names for the private, commercial and public sectors.

**ASSA ABLOY** is the world's leading manufacturer and supplier of locking solutions and safety systems which fulfil strict customer requirements with regard to safety, protection and usability With over 30,000 employees, the group achieves annual sales of over 3 billion euros

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We reserve the right to make technical changes. D0057101